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**ABSTRACT OF THE INVENTION**

An inventive process is disclosed for creating a barrier layer on a silicon substrate of an in-process integrated circuit. The process uses MOCVD to form a metal oxide film. The source gas is preferably an organometallic compound. Ozone is used as an oxidizing agent in order to react with the source gas at a low temperature and fully volatilize carbon from the source gas. The high reactivity of ozone at a low temperature provides a more uniform step coverage on contact openings. The process is used to create etch stop layers and diffusion barriers.

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